IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A lithographic projection apparatus comprising:

~~a radiation system for providing a projection beam of radiation;~~

a support structure configured to hold a ~~for supporting~~ patterning device ~~means~~, the patterning ~~means~~ device configured ~~serving~~ to pattern a ~~the~~ projection beam according to a desired pattern;

a substrate table configured to hold ~~for holding~~ a substrate;

a projection system configured to project ~~for projecting~~ the patterned beam onto a target portion of the substrate;

a liquid supply system configured to ~~for~~ at least partly fill ~~filling~~ a space between the ~~final element of said~~ projection system and said substrate with liquid; and~~,~~

~~wherein said liquid supply system comprises bubble reduction means.~~

a selective heater configured to selectively control the temperature, and therefore size, of bubbles of a particular composition in the liquid.

2. (Currently Amended) A lithographic projection apparatus according to claim 1, ~~wherein said bubble reduction means comprise~~ further comprising a bubble detector ~~detection means~~.

3. (Currently Amended) A lithographic projection apparatus according to claim 2, wherein said bubble detector ~~detection means~~ comprises at least one ultrasonic transducer, the attenuation of ultrasonic waves in said liquid being measured by said transducer so as to obtain information about bubbles present in said liquid.

4. (Original) A lithographic projection apparatus according to claim 3 wherein said ultrasonic transducer measures ultrasonic attenuation as a function of frequency.

5. (Currently Amended) A lithographic projection apparatus according to claim 1, ~~wherein said bubble reduction means comprise~~ further comprising a bubble removal device ~~means~~.

6. (Currently Amended) A lithographic projection apparatus according to claim 5, wherein said bubble removal device ~~means~~ comprises a degassing device, said degassing device comprising an isolation chamber, wherein a space above liquid in said isolation chamber is maintained at a pressure below atmospheric pressure encouraging previously dissolved gases to come out of solution and be pumped away.

7. (Currently Amended) A lithographic projection apparatus according to claim 5, wherein said bubble removal device ~~means~~ is configured to provide ~~provides~~ a continuous flow of liquid over a ~~the~~ final element of said projection system and said substrate to transport bubbles in said liquid out of said space between ~~the final element of~~ said projection system and said substrate.

8. (Currently Amended) A lithographic projection apparatus according to claim 1, ~~wherein said bubble reduction means comprise~~ further comprising a liquid pressurization device to pressurize said liquid above atmospheric pressure to minimize the size of bubbles and encourage bubble-forming gases to dissolve into said liquid.

9. (Original) A lithographic projection apparatus according to claim 1, wherein the composition of said liquid is chosen to have a lower surface tension than water.

10. (Currently Amended) A lithographic projection apparatus according to claim 1, wherein a bubble detector, a bubble removal device, or both, is configured to ~~said bubble reduction means~~ treat said liquid before it is supplied to said space between ~~the final element of~~ said projection system and said substrate.

11. (Original) A lithographic projection apparatus according to claim 10, wherein the treated liquid is kept in a sealed container, excess space in said sealed container being filled with one or more of the following: nitrogen gas, argon gas, helium gas or a vacuum.

12. (Original) A lithographic projection apparatus according to claim 3, wherein an ultrasonic transducer is arranged in a pulse-echo configuration, said transducer acting both to transmit ultrasonic waves and, after reflection, to receive ultrasonic waves that have been attenuated during propagation along a path through said liquid.

13. (Currently Amended) A lithographic projection apparatus according to claim 3, wherein said bubble detector ~~detection means~~ comprises two spatially separated ultrasonic transducers, the first arranged to transmit ultrasonic waves, and the second to receive ultrasonic waves that have been attenuated during propagation along a path through said liquid between the two transducers.

14. (Currently Amended) A lithographic projection apparatus according to claim 5, wherein said bubble removal device ~~means~~ includes two spatially separated ultrasonic transducers, arranged to produce ultrasonic standing-wave patterns within said liquid which trap bubbles within the nodal regions, said bubble removal device ~~means~~ being arranged to displace said bubbles through the use of a phase-adjusting device ~~means~~ linked with said transducers, said phase-adjusting device ~~means~~ causing spatial shift of nodal regions and bubbles trapped therein.

15. (Currently Amended) A lithographic projection apparatus according to claim 5, wherein said bubble removal device ~~means~~ comprises an electric field generator configured to apply ~~for applying~~ an electric field to said liquid, said electric field being capable of dislodging bubbles attached to said substrate.

16. (Cancelled)

17. (Currently Amended) A lithographic projection apparatus according to claim 1 ~~16~~, wherein said selective heater comprises a microwave source.

18. (Cancelled)

19. (Cancelled)

20. (Currently Amended) A lithographic projection apparatus according to claim 2, wherein said bubble detector ~~detection means~~ comprises a light source, a light detector and a light comparator, said light source and said light detector being arranged so that light emitted by said source propagates between said source and said detector through a portion of said liquid, said comparator being arranged to detect changes in the proportion of said emitted light that arrives at said detector after propagation through a portion of said liquid.

21. (Cancelled)

22. (Cancelled)

23. (Currently Amended) A device manufacturing method comprising:

~~providing a substrate that is at least partially covered by a layer of radiation-sensitive material;~~

~~providing a projection beam of radiation using a radiation system;~~

~~using patterning means to endow the projection beam with a pattern in its cross-section;~~

~~projecting the patterned beam of radiation onto a target portion of the layer of radiation-sensitive material; and~~

~~providing a liquid supply system for~~ at least partly filling a space between ~~the final element of said~~ a projection system of a lithographic apparatus and a ~~said~~ substrate with liquid;

projecting a patterned radiation beam using the projection system, through the liquid, onto a target portion of a substrate; and

selectively controlling the temperature, and therefore size, of bubbles of a particular composition in the liquid.

~~reducing bubbles in said liquid supply system.~~

24. (Cancelled)

25. (New) A lithographic projection apparatus according to claim 1, further comprising a liquid quality monitor capable of switching the operational state of the projection apparatus between an active state and a suspended state, the active state being selected when the liquid quality is determined to be above a predefined threshold and the suspended state being selected when the liquid quality is determined to be below a predefined threshold state.

26. (New) A device manufacturing method according to claim 23, wherein selectively controlling the temperature comprises heating using a microwave source.

27. (New) A device manufacturing method according to claim 23, further comprising producing ultrasonic standing-wave patterns within the liquid which trap bubbles within the nodal regions and causing spatial shift of the nodal regions to displace the trapped bubbles.

28. (New) A lithographic projection apparatus comprising:

a support structure configured to hold a patterning device, the patterning device configured to pattern a projection beam according to a desired pattern;

a substrate table configured to hold a substrate;

a projection system configured to project the patterned beam onto a target portion of the substrate;

a liquid supply system configured to at least partly fill a space between the projection system and the substrate with liquid;

a particle input device configured to introduce particles into the liquid; and

a particle removal device configured to remove the particles from the liquid.

29. (New) A lithographic projection apparatus according to claim 28, wherein the particles comprise a surface with characteristics that encourage bubbles to attach thereto.

30. (New) A lithographic projection apparatus according to claim 28, further comprising at least one ultrasonic transducer, the attenuation of ultrasonic waves in said liquid being measured by said transducer so as to obtain information about bubbles present in said liquid.